

WHAT IS CLAIMED IS:

1. A fuel supply pump for pressurizing a fuel fed from a low-pressure feed pump, said fuel supply pump comprising:

5 a pump element having a plunger and a compressing chamber, said compressing chamber being connected through a fuel supply path to the low-pressure feed pump, said fuel fed from the low-pressure feed pump being supplied to the compressing chamber through the fuel supply path, said plunger pressurizing the fuel supplied to the compressing
10 chamber;

a plunger driving unit having a driving member and a housing for reciprocating said plunger, said driving member being rotatably supported to the housing and slidably contacted to the plunger;

a control member provided in the fuel supply path to control a fuel
15 rate of the fuel fed from the low-pressure pump through the fuel supply path;

a check valve provided in a part of the fuel supply path, said part of the fuel supply path being connected between the control member and the compressing chamber, said check valve preventing the fuel supplied to the
20 compressing chamber from flowing backward to the control member;

lubricating means for supplying a part of fuel to a slidably contact portion between the plunger and the plunger driving unit, said part of fuel being fed from the low-pressure feed pump through the fuel supply path; and

25 fuel relief means for relieving a part of fuel to the slidably contact portion between the plunger and the plunger driving unit, said part of fuel

being supplied through the part of the fuel supply path to the compressing chamber.

2. A fuel supply pump according to claim 1, wherein said fuel
5 relief means is disposed to be substantially parallel to the lubricating means.

3. A fuel supply pump according to claim 1, wherein said fuel relief means is provided with a throttle.

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4. A fuel supply pump according to claim 1, wherein said housing has an inner hollow chamber in which the slidably contact portion is contained, said fuel relief means is branched from the part of fuel supply path and connected to the housing, and said fuel relief means
15 is communicated with the inner hollow chamber.

5. A fuel supply pump for pressurizing a fuel fed from a low-pressure feed pump, said fuel supply pump comprising:

a pump element having a plunger and a compressing chamber,
20 said compressing chamber being connected through a fuel supply path to the low-pressure feed pump, said fuel fed from the low-pressure feed pump being supplied to the compressing chamber through the fuel supply path, said plunger pressurizing the fuel supplied to the compressing chamber;

25 a plunger driving unit having a driving member and a housing for reciprocating said plunger, said driving member being rotatably supported

to the housing and slidably contacted to the plunger;

a control member provided in the fuel supply path to control a fuel rate of the fuel fed from the low-pressure pump through the fuel supply path;

5 a check valve provided in a part of the fuel supply path, said part of the fuel supply path being connected between the control member and the compressing chamber, said check valve preventing the fuel supplied to the compressing chamber from flowing backward to the control member;

lubricating means for supplying a part of fuel to a slidably contact
10 portion between the plunger and the plunger driving unit, said part of fuel being fed from the low-pressure feed pump through the fuel supply path;

first throttle means provided in the lubricating means for controlling the part of fuel supplied through the lubricating means; and

fuel relief means for relieving a part of fuel into a downstream side
15 of the lubricating means with respect to the first throttle means, said part of fuel being supplied through the fuel supply means to the compressing chamber.

6. A fuel supply pump according to claim 5, wherein said fuel
20 relief means is provided with second throttle means.